FLAVONOIDS OF Artemisia argyi

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We have investigated the flavonoid composition of Artemisia argyi Level. et Vaniot (family Asteraceae). The epigeal part of this wormwood collected in the late building phase in the environs of the village of Kuguki, Ussuri region, (Maritime Territory) in August 1983, was extracted with 70% aqueous ethanol. The extract, concentrated to a syrupy residue, was treated with hot distilled water, and the aqueous extract was treated successively with chloroform and ethyl acetate. The chloroform extract proved to be the richest in flavonoids, and this was chromatographed on a column of silica gel (L 40/100). Elution was performed with chloroform and with mixtures of chloroform and ethanol. Flavonoids (I-IV) were isolated.

Compound (I), $C_{18}H_{16}O_7$, mp 237°C (chloroform–ethanol). UV spectrum: λ_{max}^{EtOH} 279,344 nm. The appearance of a characteristic bathochromic shift (Δ 26 nm) of the absorption maximum on the addition of $AlCl_3$ + HCl showed the presence of a free hydroxyl at C-6 [1, 2]. The use of other complex-forming reagents showed an OH group only at C-5. PMR spectrum (DMSO, δ, ppm): 7.52 (dd, J_1 = 9 Hz, J_2 = 2.5 Hz, H-6'); 7.41 (d, J = 2.5 Hz, H-2'); 6.98 (d, J = 9 Hz; H-5'); 6.75 (s, H-8); 6.52 (s, H-3); 3.80 and 3.78 (3H, s, each 2 × OCH_3 at C-3' and C-4'); 3.70 (s, 3H, OCH_3 at C-7). Compound (I) formed a diacetate with the composition $C_{22}H_{20}O_9$, mp 155°C. PMR spectrum ($CDCl_3$, δ, ppm): 7.50 (dd, J_1 = 9 Hz, J_2 = 2 Hz, H-6'); 7.25 (d, J =2 Hz, H-2'); 6.95 (d, J = 9 Hz, H-5'); 6.65 (s, H-8); 6.55 (s, H-3); 3.98 (s, 6H, OCH_3 at C-3' and C-4'); 3.85 (s, 3H, OCH_3 at C-7); 2.52 and 2.40 (3H, s, each 2 × $COOCH_3$ at C-5 and C-6).

By an analysis of spectral characteristics and physical constants, the structure of (I) was determined as 5,6-dihydroxy-3',4',7-trimethoxyflavone. Japanese scientists have synthesized 5,6-dihydroxy-3',4',7-trimethoxyflavones [3], and this had a melting point close to that of flavonoid (I) (mp 232°C). Compounds (II), $C_{18}H_{16}O_7$, mp 200°C (diacetate with mp 180°C); (III), mp $C_{18}H_{16}O_7$, mp 204°C; and (IV), $C_{17}H_{14}O_7$, mp 228°C, were identified on the basis of their UV, IR, and PMR spectra and a comparison of them with of authentic samples as eupatorin, cirsilineol, and jaceoside, respectively.

From the same species, Japanese workers have isolated eupatilin and 5-hydroxy-3',4',6,7-tetramethoxyflavone [4]. This is the first time that the compound that we have isolated has been detected in A. argyi.

LITERATURE CITED

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